

Research paper*Hibiscus makinoi* Y. Jotani & H. Ohba (Malvaceae), A New Record Plant in TaiwanHuei-Yi Liu¹ Chien-Ti Chao¹ Yen- Hsueh Tseng^{1,*}

【Abstract】 *Hibiscus makinoi* Y. Jotani & H. Ohba, formerly recognized as endemic to Southern Japan and Ryukyu islands, now as a newly record species distributed from seashore to 1,800 m altitude in Eastern Taiwan. This species was misidentified as *H. mutabilis* L. or *H. taiwanensis* S. Y. Hu in past decades. *Hibiscus makinoi* could be distinguished by the shape of epicalyx lobes and indumentum type. Distribution map, photographs, and line drawings were provided to aid identification.

【Key words】 *Hibiscus makinoi*, Malvaceae, new record, Taiwan

研究報告

臺灣新紀錄錦葵科植物—牧野氏山芙蓉

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【摘要】近年作者等致力於臺灣產木槿屬(*Hibiscus*)之分類研究，經野地調查後，發現產於臺灣東部的分類群與其他原生及馴化種類有異，再與文獻考證及標本比對後，確認為分布於日本南部、琉球群島的牧野氏山芙蓉 (*H. makinoi* Y. Jotani & H. Ohba)。本種為臺灣新紀錄錦葵科(Malvaceae)植物，主要產於台灣東部之低、中海拔山麓地區、公路兩旁及海岸。因形態特徵與木芙蓉 (*H. mutabilis* L.) 與臺灣山芙蓉 (*H. taiwanensis* S. Y. Hu) 相似，經常被混淆及誤認，但本種以線形之副萼裂片與被顆粒狀星狀毛與短絨毛而有別於臺灣其他種類。本文描述其形態特徵、地理分佈及生育地環境，並提供彩色圖片、引證標本與線繪圖以資辨識。

【關鍵詞】牧野氏山芙蓉、錦葵科、新記錄植物、臺灣

INTRODUCTION

Hibiscus is a Malvaceous genus with ca. 200 species, distributed in America, Africa, Asia, Australia, and elsewhere, numerous species had ornamental or medical utility, like *H. rosa-sinensis*

L. or *H. mutabilis* L. (Tang *et al.*, 2007; Fryxell, 1988). Five species of *Hibiscus* were recognized in the second edition of Flora of Taiwan (Chang, 1993; Boufford *et al.*, 2003). In these years, the study of Malvaceae found several newly recorded

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or naturalized species in Taiwan (Liu *et al.*, 2013; Li and Wang, 2012; Lin *et al.*, 2010, 2011, 2012; Wang and Li, 2013), we found Taiwanese *Hibiscus* had conspicuous morphology variety, different with description in Flora of Taiwan (Chang, 1993). After field work and literature reviewed (Henry 1896; Matsumura & Hayata 1906; Kawakami 1910, Hayata 1911; Sasaki 1928; Masamune 1954; Chang 1977; Chang 1993; Meyer & Walker, 1984; Walker 1976; Tang *et al.* 2007), we discovered a new record species in Eastern Taiwan.

New record species

Hibiscus makinoi Y. Jotani & H. Ohba, J. Japan. Bot. 59: 214-222. 1984.

牧野氏山芙蓉 Fig. 1, 2

Small trees, stems erect, up to 3-5 m high, branchlet, leaves, petioles, pedicels and calyx granulated stellate and pubescent. Leaves 7.2-15.4 cm long, 6.6-15.0 cm broad; alternate, 3-5 lobes, obtuse at apex, cordate at base, irregular crenate, stellate-hairy and puberulent beneath, stellate hairs above; palmately net vein, basally 5-7 veined; petiole 3.1-15.4 cm long; stipules 1.2-12.6 mm long, ovate-lanceolate. Flower axillary, solitary, peduncle 8.8-15.3 cm, pedicel 2.2-2.6 cm, jointed near the apex; epicalyx lobes 7-11, linear-lanceolate or narrowly lanceolate, 1.6-2.4 cm long, 0.3-0.4 cm broad, reflexed at apex; calyx campanulate, jointed, lobes 5, triangular, surface veined, 1.8-2.8 cm long, 1.1-1.6 cm broad; corolla pink to white, 6.6-10.5 cm in diameter, petals 5, flabellate, imbricate, yellow at base, 3.3-3.7 cm long; Stamens monadelphous, staminal tube 2.8-4.1 cm, stamens 140-145, filament 7.0-7.6 mm long, anther 1.4-1.8 mm; pollen grain ca. 129.7 μ m, spheroidal, pantoporate, spines on the surface; pistil 72.1-75.5 mm long, sigma yellow,

style branch 5. Capsule globose, 14.9-30.0 mm in diameter, densely long-hairy outside, loculicidally 5-valved; seed reniform, 2.3-2.5 mm, densely long-hairy.

Southern Japan and Ryukyu islands. Taiwan in Low elevation of Ilan, Hualien and Taitung County, included Lutao and Lanyu.

Specimens examined:

Ilan County (宜蘭縣): Datong Township (大同鄉), Provincial Highway No. 7, 9 km, *H. Y. Liu 194* (TCF); Suao Town (蘇澳鎮), Provincial Highway No. 9, 115 km, *Liu 289* (TCF), same loc., *C. T. Chao 376, 377*; Tungao Township (東澳鄉), *P. F. Lu 17607* (HAST). Nanfangao (南方澳), *J. S. Wu 2058* (TNM).

Hualien County (花蓮縣): Sioulin Township (秀林鄉), Sinbaiyang (新白楊), *S. Y. Lu 17012, 17125* (TAIF); Suhua Highway (蘇花公路) 178 km, *H. Y. Liu 224* (TCF); Guangfu Township (光復鄉), County road No. 193, 73 km, *H. Y. Liu 305* (TCF); Jouhsi Township (卓溪鄉), Provincial Highway No. 30, 0.5 km, *H. Y. Liu 237* (TCF);

Taitung County (臺東縣): Luye Township (鹿野鄉), County road No. 197, 21.5 km, *H. Y. Liu 240* (TCF); Lichia (利嘉), *S. Y. Lu 17452, 17465* (TAIF); Dawu Township (大武鄉), North branch of Stream Tawu (大武溪北支流), *J. S. Wu 2145* (TNM); Ludao Township (綠島鄉), Kuo-shan Trail (過山古道), *C. M. Wang & G. P. Hsieh 7213* (TNM); Lanyu Township (蘭嶼鄉), Across-island Highway (橫貫公路), *H. Y. Liu & J. Y. Jiang 268* (TCF).

Discussion

Hibiscus makinoi was first described by Jotani and Ohba in 1984. In the past decades,

this species was thought to be endemic to Japan, common and widespread in southern Japan and Ryukyu islands (Jotani and Ohba, 1984; Peng *et al.*, 2007). But we found this species distributed in Eastern Taiwan, from south part of Ilan County through Hualien County to Taitung County, the southeast distribution maybe located at Dawu township (excluded Lanyu). As the other species in Taiwan, most populations were grown at open and dry mountain slope, roadside, or riverbed. Vertical distribution from near sea level to altitude ca. 1,800 m in mountain area. In the original paper (Jotani and Ohba, 1984), the authors mentioned the wild *Hibiscus* population in Tawu,

Chinlun, Chengkung maybe resembled to this species, but need further study. We also made field survey in such location, the plants we found were belonged to this taxa. Moreover, the populations we found in eastern Taiwan were mostly referred to this species.

Hibiscus makinoi also resembles to other congenus species in Taiwan, like *H. mutabilis* L. and *H. taiwanensis* S. Y. Hu (Hu, 1955; Feng, 1984), but this species had linear-lanceolate to narrow lanceolate epicalyx lobes, leaves apex obtuse and covered with stellate and puberulent hairs could be distinguished with similar taxa (Table 1).

Table 1. Comparison of *Hibiscus mutabilis* L., *H. makinoi* Y. Jotani & H. Ohba and *H. taiwanensis* S. Y. Hu

Species	<i>H. mutabilis</i>	<i>H. makinoi</i>	<i>H. taiwanensis</i>
Indumentum	stellate puberulent and glanular hairs	granulated stellate pubescent	strigose puberulent hairs
Leaf lobes apex	acuminate	obtuse	obtuse to acuminate
Stipule	lanceolate	ovate-lanceolate	narrowly lanceolate
Calyx lobes	ovate, no expand at base	broadly triangular, no expand at base	broadly triangular, no expand at base
Epicalyx lobes	8-11	7-11	7-9
size (cm)	1.3-1.7 × 0.2-0.3	1.6-2.4 × 0.3-0.4	1.3-1.6 × 0.3-0.5
shape	linear	linear-lanceolate or narrowly lanceolate	linear-lanceolate
apex	non-reflexed, the lobes shorter than the calyx	reflexed, the lobes longer than the calyx	non-reflexed, the lobes shorter than the calyx

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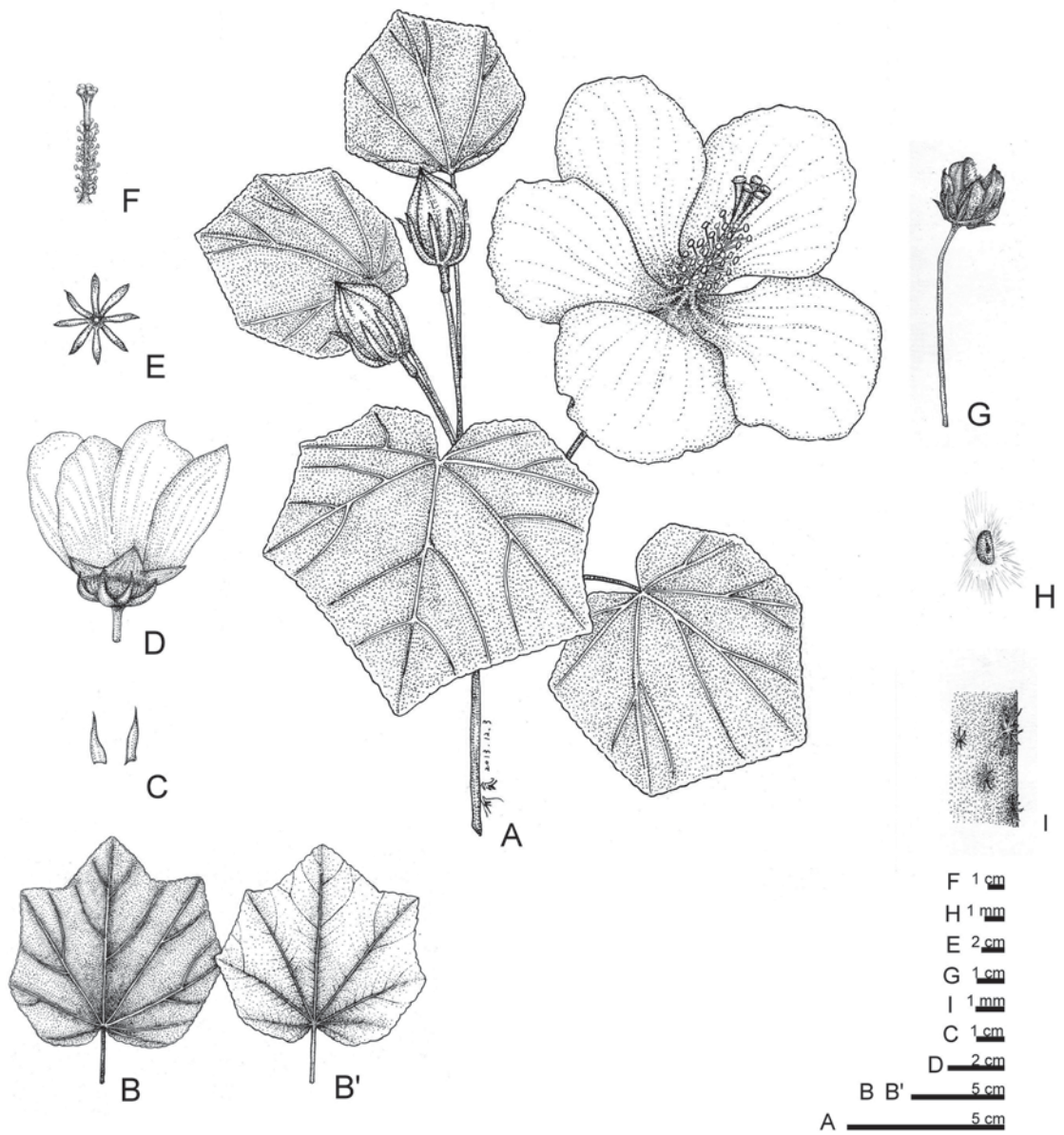


Fig. 1. *Hibiscus makinoi* Y. Jotani & H. Ohba. A. Habit B. Leaf adaxial surface B' . Leaf abaxial surface C. Stipules D. Flowers E. Epicalyx F. Monadelphous Stamen et Stigma G. Fruits H. Seeds I. Indumentum

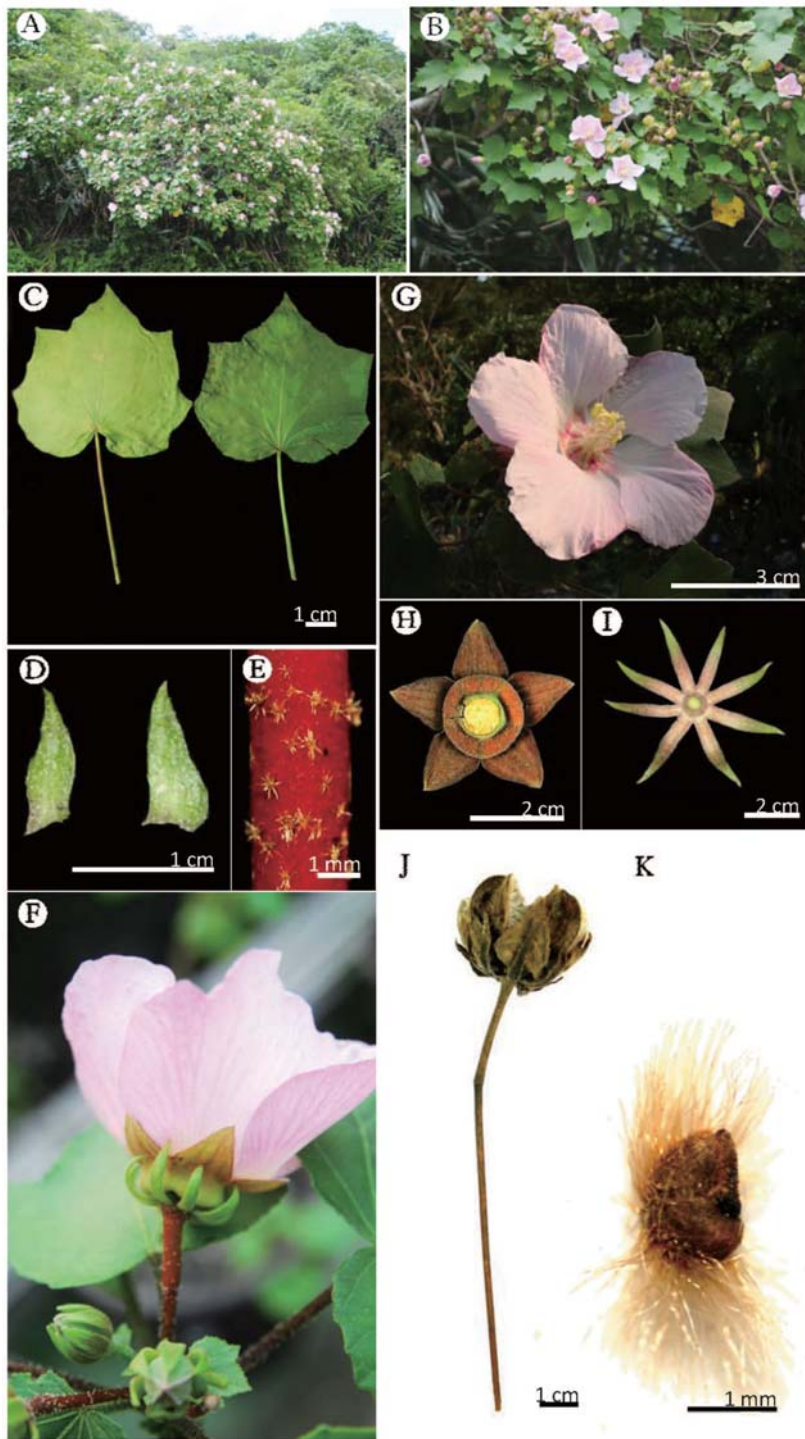


Fig. 2. *Hibiscus makinoi* Y. Jotani & H. Ohba. A. Habitat. B. Habit. C. Leaves, right: adaxial surface, left: abaxial surface D. Stipules E. Indumentum F. Inflorescences G. Flowers H. Calyx I. Epicalyx J. Fruits K. Seeds



Fig. 3. Voucher specimen of *Hibiscus makinoi* Y. Jotani & H. Ohba (H. Y. Liu 309, TCF).

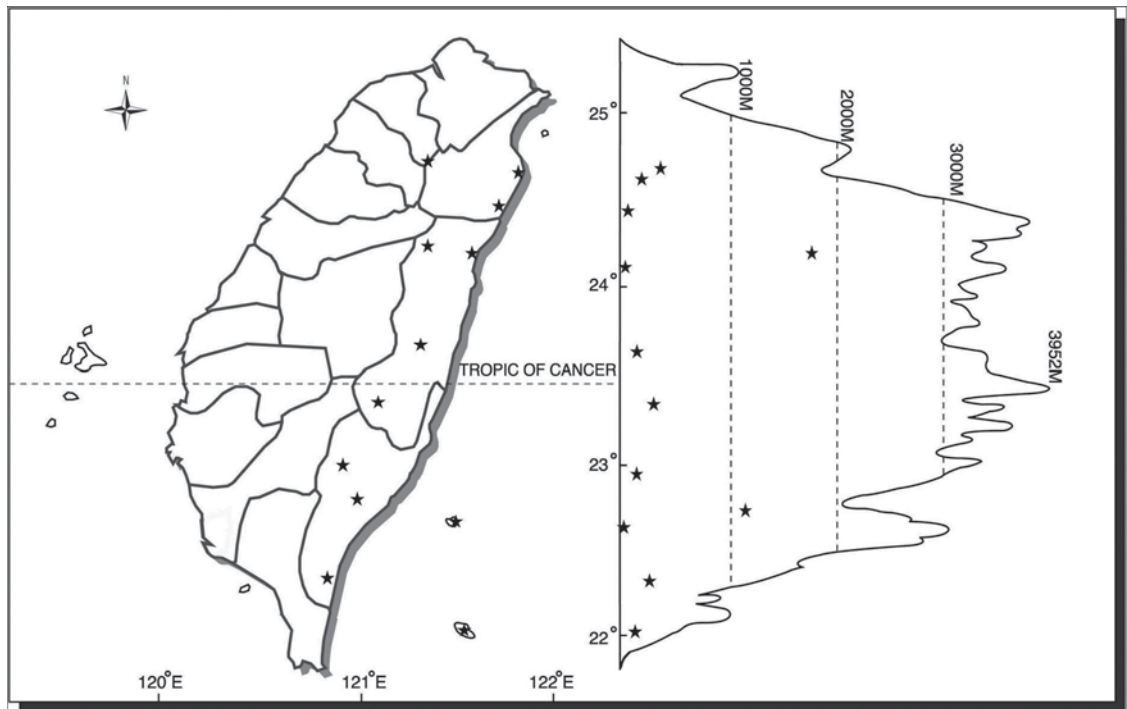


Fig. 4. Distribution map of *Hibiscus makinoi* Y. Jotani & H. Ohba.